

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11638 (2000): Proforma for Estimation of Unit Rate of Construction of Embankment by Mechanical Means [WRD 23: Measurement and Cost Analysis of Works For River Valley Projects]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



भारतीय मानक  
यांत्रिक साधनों द्वारा तटबंध निर्माण की इकाई दर  
के आकलन के लिए प्रारूप  
( पहला पुनरीक्षण )

*Indian Standard*

PROFORMA FOR ESTIMATION OF UNIT RATE OF  
CONSTRUCTION OF EMBANKMENT BY  
MECHANICAL MEANS  
( *First Revision* )

ICS 93.160:17.020

© BIS 2000

**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Cost Analysis and Cost Estimates Sectional Committee had been approved by the Water Resources Division Council.

Construction of embankments for drainages, canals, dams, etc, is generally done by mechanical means. The fill material is obtained from borrow pits selected for the purposes as well as from excavations of dam foundation and appurtenant works like spillway, tunnels, stilling basin, etc. The mode of excavation depends on site conditions as well as type of machinery and equipment used. The material suitable for embankment is either hauled to the placement site direct or stockpiled for subsequent use. The site conditions which affect the rate of production involve the type of materials, quantum of work, equipment used, conditions of haul roads, lead, lift, etc. The cost of embankment may, therefore, vary from project to project. The unit rate of construction of embankment is made up of components like drilling excavation, haulage, placement, compaction, etc.

The revision of this standard has been taken up to incorporate the items like dewatering, excavation, dressing and levelling, for the purpose of estimation of unit rate of construction, in view of the experiences gained while using the standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## *Indian Standard*

# PROFORMA FOR ESTIMATION OF UNIT RATE OF CONSTRUCTION OF EMBANKMENT BY MECHANICAL MEANS

*( First Revision )*

### 1 SCOPE

This standard lays down proforma for estimation of unit rate of construction of embankment by mechanical means.

### 2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
11399 (Part 1) : 1985	Guidelines for estimating output norms of items of work in construction of river valley projects: Part 1 Earth work excavation
11590 : 1995	Guidelines for working out unit rate cost of the construction equipment used for river valley projects

### 3 CLASSIFICATION

**3.1** The fill material may be classified as follows:

- a) *Dumped Fill* — Dumped fill involves moving of material from the site of excavation and depositing it in a fill embankment and dressed to the required level.
- b) *Rolled Fill* — The rolled fill involves placement of selected fill materials in various zones to the required fill lines, grading and compacting to the required density.

**3.2** A separate proforma for estimation of unit rate of construction of embankment by mechanical means, as given in Table 1, shall be prepared for each class of fill material.

**3.3** The proforma in Table 1, indicates the various heads/sub-heads under which the estimates have to be worked out. For each one of these heads/sub-heads, it will be necessary to prepare sub-estimates which shall include machinery, materials and labour taking into consideration site conditions, type of soil, equipment combination, working hour rates of machinery, output norms of equipment, consumables, facilities required, etc. Guidance can be obtained from IS 11399 (Part 1) and IS 11590.

**Table 1 Proforma for Estimation of Unit Rate of Equivalent Construction of Embankment by Mechanical Means for an Equivalent Lead\* in Metres**  
(Clauses 3.2 and 3.3)

Sl No. (1)	Item (2)	Unit (3)	Quantity (4)	Rate (5)	Amount (6)
i)	<i>General</i>				
a)	Royalty				
b)	Removal of overburden, shrubs, trees, etc				
c)	Dagbelling, layout, and establishment of reference pillars and benchmarks				
d)	Haul roads, haul tracks, ramps, etc				
e)	Lighting and safety measures at site				
f)	Dewatering				
ii)	<i>Excavation and Loading</i>				
a)	Drilling				
b)	Blasting				
c)	Ripping and dozing				
d)	Loading				
e)	Excavation				
iii)	<i>Haulage and Placement</i>				
a)	Transport				
b)	Dumping and spreading				
c)	Grading				
d)	Dressing and levelling				
iv)	<i>Watering and Compaction</i>				
a)	Watering				
b)	Compaction				
	Total Prime Cost (i) to (iv)				
v)	<i>Overheads</i>				
	Proportional cost of the following overheads should be added on the item of unit rate embankment:				
a)	Field Set-up				
1)	Buildings				
2)	Water supply, lighting, sanitary and drainage				
3)	Service road				
4)	Temporary constructions				
b)	Field Charges				
1)	Establishment expenditure (Salary and office-expenditure, inspection, vehicles)				
2)	Compensation, retrenchment compensation, bonus, PF, gratuity statutory holidays, leave wages, etc				
3)	Worksite amenities (medical, education, recreation, etc)				
4)	Survey [excluding item (i) (c)]				
5)	Testing of fill material for relevant requirements				
6)	Small tools and plants				
7)	Maintenance				
8)	Carriage and freight of machinery				
9)	Contingencies				
c)	Head Office and Financial Expenses				
1)	Dividend/return on capital				
2)	Indirect charges not covered under (v)(b) (2) and (v)(b) (3)				
3)	Interest charges				
4)	Profit envisaged				
	Total all-in rate				

**NOTES**

1 List of subitems mentioned under the item of overhead is only indicative. Overhead expenses are usually expressed as a percentage of total prime cost [item (i) to (iv)].

2 All items mentioned above shall include erection, operation, depreciation, repairs, maintenance and dismantling of machinery where used.

\*Equivalent lead is the shortest distance between the excavation and the fill material which takes lift into consideration. It is measured from the centre of gravity of the excavation to that of the fill including section enroute.

**Bureau of Indian Standards**

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of stardardization, marking and quality certification of goods and attending to connected matters in the country.

**Copyright**

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publication), BIS

**Review of Indian Standards**

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. WRD 19 (271).

**Amendments Issued Since Publication**

Amend No.	Date of Issue	Text Affected

**BUREAU OF INDIAN STANDARDS**

**Headquarters:**

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002  
Telephones: 323 01 31, 323 3375, 323 94 02

Telegrams: Manaksanstha  
(Common to all offices)

**Regional Offices:**

**Telephone**

Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17, 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi CALCUTTA 700054	{ 337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 38 43 60 20 25
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 832 92 95, 832 78 58 832 78 91, 832 78 92
Branches	: AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM.	